

**Same Access, But Different Activity: Can Talking (AAC Use), Writing (Computer Access), and
Driving (Powered Mobility) Really Work Together?
How It's Done with the Most Current Chair's Electronics**

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Configuring systems or using one method of access for various activities in AT is not new. However, our choices were limited and were developed for adults who could only use a standard joystick on a powered chair for mobility due to weakness from an acquired injury or from a degenerative, progressive disease. We had only few other choices based on that same technology and these were a Sip'n Puff system, or a mounted chin joystick, or a RIM control joystick (mounted on the rear of the head).

These systems are still available, and can be used as they always were, or can be used in new ways and configurations, or other methods of head access can be considered.

Today we want share the systems available, how they need to be configured, and applied, and share real case studies which demonstrate how these various methods of access can work. It is important for everyone considering these systems, to actually set them up and work them for themselves on themselves, and this can best be done if working with a partner, each trying it for themselves.

We will also share strategies of how to configure these systems and "teach" their use to children. Children are not small adults, and require very different strategies of learning new systems, and of configuration of these systems. Most of the children who will be using AT will grow, mature, and change. (Some may have a degenerative disease, but still they are children, who are acquiring skills and experience, not trying to duplicate it, as with an adult who has had an injury).

Setting up any system which will allow the use of a same method of access for varied equipment first requires a powered chair. Currently there are four primary manufacturers of powered chairs (with programmable electronics) available in the USA. These are: Invacare, Quickie (Sunrise Medical), Quantum Rehab (Pride), and Permobil. It has only been within the last year, that each of these manufacturer's have utilized specific electronics to their chairs. (Permobil, Quickie and Quantum Rehab had used Penngy & Giles electronics while Invacare had its own). However, no matter whose powered chair is utilized, these items are necessary when expecting to manage other activities with the same access:

1. A remote programmer
2. A visual display
3. A separate mode change/reset switch
4. An AUX (auxiliary) or ACM (auxiliary control module) or COM (communication module) or ECU (environmental control module) interface box. Each company has its own "name" but these all function the same.
4. A primary method of access:
 - a. A head array (3 switch head access)
 - b. Multiple fiber optic switch access (usually with hand)
 - c. Chin joystick or standard joystick or Peachtree Proportional head Controller
 - d. Multiple mechanical switches (in an array or separate)
5. Cables and wiring harnesses to attach these parts to the powered chair's base.

The systems which can be managed by the same method of access are:

1. Driving a powered chair
2. Managing powered seat functions (changing positions), powered tilt-in space, powered recline, powered leg elevation, powered seat elevation, powered seat to floor

3. Using a communication device
4. Using a computer
5. Managing other electronic devices (TV, DVD, CD, phone, lights, door opener, etc.)

No one who is using a powered chair or has used one by driving with a joystick should be presumed to be able to immediately learn how to use the chair with alternative access. The persons teaching/assessing (therapist/teacher/parent and the medical suppliers) should be, themselves competent at driving and managing tasks using alternative access. They also need to be competent at programming the powered chair, and competent at teach its use. The child and parent (and teacher and therapist) must know how things can be altered by programming and how to do it. This cannot occur in a single session at fitting and delivery. Instead, follow-up should be planned and presumed a part of the delivery process.

We will start by configuring the alternative driver controls, and then after we have discussed these, we will discuss how to set up the systems for access to other tasks besides the driving.

Current Electronics on systems:

1. Invacare: Mark 6 (previously had MKIV and MKV)
2. Permobil: R-net electronics (newPenny and Giles)
3. Quickie : new Qtronix electronics from Delphi
4. Quantum Rehab (Pride): Q-logic electronics from Curtiss

We may be able to demonstrate these, or not, depending on the timing of the availability, however, the conceptual framework of these configurations will remain the same. And, you may still have to deal with older chairs on the market, remember, all the principles will remain the same.)

Definition of Terms: (*Biggest Mistakes currently made are not knowing these terms*)

1. Programmability is of the chair's performance, not the access technique
2. Proportional vs. Non-proportional
 - a. Peachtree, Chin Joystick, joystick are proportional
 - b. Sip 'n Puff, Proximity 3 Switch Head Array, Combo are non-proportional
3. Reset/Mode change switch exists in both (for proportional and non- proportional systems)
4. Visual Display
5. Remote programmer
6. Three Switch Head Array (proximity switch) with fixed or adjustable laterals
7. Programmable Electronics: Each brand of chair's unique programmability, how its done, What is necessary, how display works
8. ACM, ECU, Auxiliary Interface, COM interface, D-9 ports, wired & "wireless"

Alternative Head Access Choices:

1. 3 switch head array, adjustable or fixed pads (large or small); (non- proportional)
2. Sip 'n puff (non-proportional)
3. Sip 'n puff with proximity switches (combo) (Non-proportional)
4. Chin joystick (proportional)
5. Mini chin joystick (proportional)
6. Rim Control (proportional joystick)
7. Rim Control (non-proportional)
8. Peachtree Proportional Control (proportional)
9. Single switch scanning (non-proportional)

Configuration and Programming for Children:

1. Programming is the first and most important issue
 2. Seating for ACCESS is the next most important issue
 3. Physical configuration to begin learning is next
 4. How, Where, and What to teach is the next most critical
1. How to program chair's responsiveness with head access
 - a. Non-proportional control

Switches must have Immediacy of responsiveness, vs. any delay

Adjust Acceleration, Deceleration, Sensitivity

Speed is slow

Teaching mobility first, not driving, usually NO reverse

b. Proportional control

Speed is slow as frequently this compensates for lack of control

Acceleration, deceleration must be delayed

2. Difference in electronics programmability in various chairs

All systems do not function the same after this step. For driving, all four manufacturers allow for ease of programming for driving. However, as soon as other activities need to be managed, these systems vary dramatically.

Invacare:

1. Auditory beeps, different sounds for different activity
2. Due to auditory cues, can manage without seeing the visual display, don't have to read
3. Each "drive" is mutually exclusive
4. Can adjust "torque" independently (slow speed, but more power to get up over door thresholds, or manage carpeting)
5. Management of reset/mode change switch is not "time" dependent, nor sequence dependent

Quickie, Permobil, Quantum:

1. All of these systems do require the visual display, to see and to read it
 2. All of these systems have auditory cues, but the same cue, consequently it only cues the user that something is happening, not what is happening
 3. Reset/mode change switch is time and sequence dependent
 4. All drives when other functions are added are "global"
 5. Torque control is "automatic" not programmable
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3. How to manage powered seat function, too
 4. Looking at additional switch sites for mode/reset switch
 - a. What switch to use
 - 1). Electronic switch: infrared or proximity or fiber optic
 - 2). Mechanical switch, which one, where located
 - b. Where to locate it
 - 1). Need for stability of placement
 - 2). Need for transfers in and out of chair
 5. Try with various Powered Chairs (P&G vs. MK5; soon to be Curtis, Delphi and P&G)
 - a. All systems do not function equally
 - b. Remember, must mount access control, visual display reset/mode change switch
 - c. Use of chair in various environments, and with what tasks
 - d. How to manage powered seat functions and AAC access or computer access

Application:

1. How to teach: Peachtree, driving first, then On/Off and Mode/reset switch last
2. Chin Joystick, drive first, then look for RIM control or reverse, may try reverse switch first, then change to RIM
3. Head Array, then add reset/mode switch again, RIM vs. Reverse as a separate switch
4. Where initial reset/mode change switch starts is not where it ends up
5. Make sure all driving is competent first, before adding other access
6. Do not set up everything at its "optimal" site, until machine is fully learned
7. Visual display Dependent or Not: where to mount and why and on what
8. Teaching use for TBI, different from SCI and different from ALS
9. For Invacare electronics, two modes of access can still "live" simultaneously, for P&G, not possible, all access is "global"

Wheelchair Manufacturers and Programmable Electronics:

1. Invacare Corporation, One Invacare Way, P.O. Box 4028, Elyria OH 44036-2125; 800-333-6900; www.invacare.com
2. Sunrise Medical/Quickie, 2842 Business Park Ave., Fresno, CA 93727-1328; 800-456-8168; FAX: 209-292-7412; www.sunrisemedical.com
3. Permobil Inc., 6961 Eastgate Blvd., Lebanon, TN 37090; 800-736-0925; FAX: 800-231-3256; www.permobil.com
4. Quantum Products, Inc., 182 Susquehanna Ave., Exeter, PA 18634; 800-800-8586; www.pridemobility.com

Electronic and Other Switches:

a. Proximity Switches

Can be located within a Head Array or placed within a tray for hand use or placed anywhere else.

Can be used with a battery pack in a single or two switch combination.

Can be used in a head array with a powered chair

Can be adjustable (larger switch, can be placed under or behind head array) or not adjustable (one distance)

I use these the most often, as I find them extremely adjustable to most circumstances.

b. Fiber optic switches

Can be located anywhere, but cable must be protected, generally best in a tray, or in tubing

Have adjustability in distance (nearness) to switch

Multiples can be placed very close together if ROM is compromised

Can be used as a “reset” switch and mounted on a head rest, too

c. Photo electric switch

Also has adjustability, I have used this to assist in powered mobility driving with kids with visual impairments, attached to a buzzer/audio feedback to “mark” nearness to wall in hall

From: COMATION, 125 Spur 191, Suite D, P.O. Box 255, Spicewood, TX 78669; 830-798-1914

Fax: 830-798-6021 www.comation.com

d. These can be mounted readily in many situations, especially mounted to wheelchairs. Contact ASL (Adaptive Switch Labs is used to developing customization, call them and talk).

e. Mechanical switches; Comation also has mechanical switches, I like their micro-lite, and wobble switch.

f. Mini joystick, (a very small joystick, light touch, can be mounted multiple places)

If ordering as a speech therapist or teacher, when calling ASL, ask for COMATION, (equipment can be purchased directly instead of through ASL which requires a medical supplier as it is most often for powered chairs)

by Adaptive Switch Labs & , 125 Spur 191, Suite C, P.O. Box 626, Spicewood TX 78669;

1-800-626-8698; www.asl-inc.com

g. TASH Switches (send for a catalog, these are not all, just ones I often use.)

TASH Buddy button, (light touch with aud. feedback) My favorite

Other TASH switches I use at times; (they have many others you may want to try also).

TASH Leaf Switch, (a light touch switch with aud. feedback it is a long metal switch)

TASH Wafer Board, (a membrane switch, NO aud. feedback, I use often for attendant control)

TASH Ability Switch Tester Need to test switches regularly.

From: TASH, Inc. (Technical Aids & Systems for the Handicapped), Unit 1, 91 Station Street, Ajax, Ontario, Canada L1S 3H2; 800-463-5685; www.tashint.com

h. Ablenet switches

Jellybean Switches (with aud. and can touch any part of the surface of the switch, fairly light touch)

SPEC switch (little jellybean, sold with plate, velcro, or without, LOVE these new ones!)

Big RED (I use this rarely)

NEW; Jelly Beamer, wireless switch, best used with hands, but no cables, (uses batteries)

Airlink Cordless switch, again cordless, works with their ECU module, PowerLink

From: ABLENET, Inc., 1081 Tenth Ave. S.E., Minneapolis, MN 55414-1312; 1-800-322-0956
www.ablenetinc.com

i. Zygo Lever Switches, (with auditory feedback and adjustable pressure)

From: ZYGO, Industries Inc. P.O. Box 1008, Portland, OR 97207-1008; 1-800-234-6001; www.zygo-usa.com

2. Switch Mounting (*This is not an inclusive list, just some I use now and like*)

a. Magic Arm System, 2 systems: ultimately adjustable with nice knob, my favorite ultimate switch mount on the market as it is easiest to adjust & **Articulated Arm,** (“Magic’s little brother,” 3 knobs but cheaper),

“Stick and suck” pads for easy switch placement instead of velcro

From: R.J. Cooper, 24843 Del Prado Suite 283, Dana Point, CA 92629, 1-800-RJCooper;

www.rjcooper.com

b. Slim Armstrong Mount From: ABLENET, Inc., 1081 Tenth Ave. S.E., Minneapolis, MN 55414-1312; 1-800-322-0956; FAX: 612-379-9143; www.ablenetinc.com

c. Switch Mounting Arm, Comation (see under switches), www.comation.inc

d. Switch Mounting Systems, even separate switch Hardware, and Switch Mounting Kits from TASH (see under switches), www.tashinc.com

e. Stem Switch Mount and Communication mounts by Daedalus Technologies, Inc., 2491 Vauxhall Place, Richmond, BC, Canada, V6V 1Z5; 1-800-561-5570; FAX: 604-244-8443: Mounting systems for switches, communication aids, too and trays. Especially helpful, and ;make custom systems. Make attachments and “mounting blocks” for all Tilt bases. My most favorite systems, reliable, adjustable, and durable. www.daessy.com

f. Switch Mounts and Switch mounting kit: made for all of their switches, but work well for others, too.

From: Zygo Industries (see under switches). www.zygo-usa.com

Mouse Emulation and Multiple Switch Interface:

a. Mouse emulation, 3 switch, both wired and wireless, USB

This 3 switch configuration (one switch moves cursor up & down, one switch moves cursor right and left, one switch controls click, double click and click ‘n drag) can only be purchased (at this time)

The “hard-wired” mouse emulator is both a 3 and 5 switch, can be configured either way. However, if “wireless” is chosen and you obtain both a transmitter and receiver, then the emulator is only 3 OR 5 switch and cannot be reconfigured. As far as I know at this time, the 3 switch configuration can only be obtained from Comation.

From Comation: www.comation.com

b. Other Mouse Emulation and emulators

Mouse emulation can occur various ways, and many manufacturers have alternative mice, like trackballs, or “head” mouse, have different software or other hardware, too. I have tried many, and, finally this whole area of interest in increasing for the individuals we serve the most. Inquire if a “trial” can occur with new equipment, review information on the internet. Talk to your AT consultants, as they have been able to view many of these hardware/software combinations at conferences like Closing the Gap, ATIA, TASH, AOTA, etc. However, as a few additional resources, I do have some favorites. I really love the company INFOGRIP. They sell many products not readily available other places, and some equipment available from other manufacturers. They sell all types of alternative mice, trackballs, etc. They are an excellent resource and a reputable company. They have also developed some software themselves, PointSmart (which you can request a free demo CD to try), which helps really “slow” a mouse among other things (more than you can on the computer’s controls).

Infogrip www.infogrip.com

The Head Mouse

I love the head mouse. However, many of the individuals I work with can’t get control of it quickly, as they are very unfamiliar or inexperienced with the programs/software they are attempting to control. Consequently, another form of mouse emulation or alternative mouse, I think, is more helpful to begin. Once an application or other software becomes very familiar, then a new method of access can be

tried. This is when a Head Mouse can be tried. Many of the manufacturers of these costly products do have “loaner” programs, please avail yourselves of these for your students/patients/clients. However, you need to learn to use it first, not just set it up for them to use. You move it through the programs to be tried, and become more familiar with it yourself. I have been around these Head Mice for a long time, and they have come down in price, and “new” ones appear periodically. Please don’t just look for the cheapest one, make sure you know the company, how long they’ve been around, how many have they sold and serviced, and what happens if one breaks?. . Instead of “saving” money up front, “spend” money wisely, by purchasing reliable, durable products. Here is my favorite:

Origin Instruments’ Head Mouse and Head Mouse Extreme: www.orin.com

This device is also sold by many other companies since it works so well. I used to use the HeadMaster, but how you have to wear it on your head, is old technology. You can find others, again, at **Infogrip**.

I saw several new products at CTG this year, and at ATIA, but I haven’t yet used them. But make sure you pay attention to how the device mounts, how it is calibrated and most importantly, what software are you managing.

You will need to also look at **On-Screen Keyboard programs** when using a head mouse. Make sure you look carefully through these, too. Again, you can find them through searches on the internet, your local AT resources may have some, but, again, look at **Infogrip**, as they carry several choices, including the popular REACH on-screen keyboards. Then, you need to choose looking at **word prediction and screen reading programs** too.